



**ACDC-100 TRMS  
ACDC-100**

**Versatile AC/DC Clamp-on  
Multimeter Series**

**Users Manual**

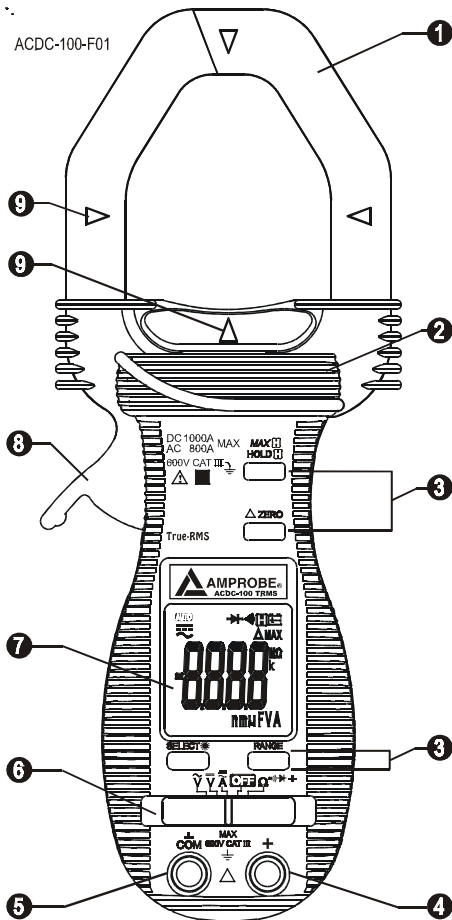


# ACDC-100 TRMS ACDC-100

Versatile AC/DC Clamp-on  
Multimeter Series














Users Manual

ACDC-100-F01



- 1 Hall-effect Clamp Jaw for AC & DC current electric field pick up
- 2 Hand/Finger Barrier to indicate the limits of safe access of the meter during measurement
- 3 Push-buttons for special functions & features
- 4 Input Jack for all functions EXCEPT non-invasive ACA & DCA current functions
- 5 Common (Ground reference) Input Jack for all functions EXCEPT non-invasive ACA & DCA current functions
- 6 Slide-switch Selector to turn the power ON/OFF and Select a function
- 7 3-3/4 digits 4000 counts LCD display
- 8 Jaw trigger for opening the clamp jaw
- 9 Jaw center Indicators, at where best ACA & DCA accuracy is specified

## SYMBOLS

	Battery		Refer to the manual
	Double insulated		Dangerous Voltage
	Direct Current		Earth Ground
	Alternating Current		Audible tone
	Conforms to relevant Australian standards.		Complies with EU directives
	Do not dispose of this product as unsorted municipal waste.		Underwriters Laboratories. [Note: Canadian and US.]
	Application around and removal from hazardous live conductors is permitted		

## SAFETY INFORMATION

- The ACDC-100 Series Digital Clampmeters conform to EN61010-1:2001; EN61010-2-032:2002; CAT III 600 V, class 2 and pollution deg.2
- This instrument is EN61010-1 certified for Installation Category III (600V). It is recommended for use in distribution level and fixed installations, as well as lesser installations, and not for primary supply lines, overhead lines and cable systems.
- Do not exceed the maximum overload limits per function (see specifications) nor the limits marked on the instrument itself. Never apply more than 600 Vdc/600 V ac rms between the test lead and earth ground.

### Warnings and Precautions

- Before and after hazardous voltage measurements, test the voltage function on a known source such as line voltage to determine proper meter functioning.
- Disconnect the test leads from the test points before changing meter functions.
- Inspect the Clampmeter, test leads and accessories before every use. Do not use any damaged part.
- Never ground yourself when taking measurements. Do not touch exposed circuit elements or test probe tips.
- Do not operate the instrument in an explosive atmosphere.
- To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.
- The meter is intended only for indoor use. To avoid electrical shock hazard, observe the proper safety precautions when working with voltages above 60 VDC or 30 VAC rms. These voltage levels pose a potential shock hazard to the user.

- Before and after hazardous voltage measurements, test the voltage function on a known source such as line voltage to determine proper meter functioning.
- Keep your hands/fingers behind the hand/finger barriers (of the meter and the test leads) that indicate the limits of safe access of the hand-held part during measurement.
- Inspect test leads, connectors, and probes for damaged insulation or exposed metal before using the instrument. If any defects are found, replace them immediately.
- This Clamp-on meter is designed to apply around or remove from uninsulated hazardous live conductors. Individual protective equipment must be used if hazardous live parts of the installation could be accessible.
- Exercise extreme caution when: measuring voltage >20 V // current >10 mA // AC power line with inductive loads // AC power line during electrical storms // current, when the fuse blows in a circuit with open circuit voltage >1000 V // servicing CRT equipment.
- Remove test leads before opening the case to change the battery.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, or capacitance.
- To avoid false readings, which could lead to possible electric shock or personal injury, replace the batteries as soon as the low battery indicator (🔋) appears.

## UNPACKING AND CONTENTS

Your shipping carton should include

- 1 ACDC-100 or ACDC-100 TRMS
- 1 Test lead set
- 2 1.5V AAA Battery (Installed)
- 1 Users Manual
- 1 Carrying Case

If any of the items are damaged or missing, immediately return the complete package to the place of purchase for an exchange.

## INTRODUCTION


The ACDC-100 and ACDC-100 TRMS Clamp-On meters are 1000 Amp / 600 V clamp meters with 50 mm jaw opening for industrial applications. The features include large conductor size and in-rush current measurement along with AC / DC voltage, AC / DC current, Resistance, Continuity and Diode Tests.

## FEATURES

### Alignment marks (see Fig. 1)

Place conductor within the jaws at the intersection of the indicated marks as close as possible to maximize the accuracy of the reading.

### MAX / HOLD

The HOLD feature freezes the display when the  button is pressed. The MAX feature compares and displays the measured maximum value as fast as 30ms with auto-ranging capability.

## HOLD

Press the **HOLD** button momentarily toggles to hold mode for all of the functions. To release the **HOLD** feature momentarily press the **HOLD** button.

## MAX

Press the **HOLD** button for 1 second or more activates the **MAX HOLD** feature for the VDC, VAC and ACA functions. To release the **MAX HOLD** feature press the **HOLD** button for 1 second or more.

## △ Relative Zero mode

Relative Zero mode allows the user to offset the subsequent meter measurements with the displayed reading as the reference value. The display will now show readings relative to the stored reference value. That is, display = reading - stored value. Pressing the button momentarily toggles to relative mode.

## SELECT / Backlight (☀)

Press Backlight button more than 1 second, enable/disable Backlight.

Press the SELECT / Backlight button to step through the manually selected  $A_{\sim}$  and  $\Omega$  functions.

$A_{\sim}$  →  $A_{\sim}$  and  $\Omega$  →  $\Omega$  →  $\rightarrow$  →  $\rightarrow$

## Manual or Auto-ranging

Press the RANGE button momentarily to select manual-ranging mode. The LCD symbol **AUTO** turns off. Press the button momentarily again to step through the Ranges. Press and hold the RANGE button for more than 1 second to resume auto-ranging.

## Auto Power Off function

The clamp meter powers down automatically after approximately 30 minutes of inactivity.

To turn it back on, move the function selector switch to OFF and back to a measuring function.

To disable Auto Power Off, press and hold the HOLD button while moving the slide switch to the desired function from OFF.

## OPERATION

### DC Voltage (see Fig. 1)

1. Set the Function Switch to  $V_{\sim}$ .
2. Connect the test leads: Red to +, Black to COM.
3. Connect the test probes to the circuit test points.
4. Read the display, and if necessary, correct any overload (OL) conditions.

### AC Voltage (see Fig. 1)

1. Set the Function Switch to  $V_{\sim}$ .
2. Connect the test leads: Red to +, Black to COM.
3. Connect the test probes to the circuit test points.
4. Read the display, and if necessary, correct any overload (OL) conditions.

### AC Current (see Fig. 2)

1. Set the Function Switch to  $\text{A} \approx$  position.
2. Select AC current using the SELECT button.
3. Open spring-loaded clamp by pressing the lever on left side of meter.
4. Position clamp around one wire or conductor and release the clamp lever. Make sure that the clamp is entirely closed. The clamp must be positioned around only one conductor. If it is placed around two or more current carrying conductors, the reading is FALSE.
5. Read the displayed value, and if necessary, correct any overload (OL) conditions.

### DC Current (see Fig. 2)

1. Set the Function Switch to  $\text{A} \approx$  position.
2. Select DC current using the SELECT button.
3. Open spring-loaded clamp by pressing the lever on left side of meter.
4. Position clamp around one wire or conductor and release the clamp lever. Make sure that the clamp is entirely closed. The clamp must be positioned around only one conductor. If it is placed around two or more current carrying conductors, the reading is FALSE.
5. Read the displayed value, and if necessary, correct any overload (OL) conditions.

### CAUTION

Using the Resistance, Continuity, Diode or Capacitance functions on a live circuit will produce false results and may damage the instrument. In many cases the suspected component must be disconnected from the circuit to obtain an accurate measurement reading.

### Resistance (see Fig. 3)

1. Set the Function Switch to  $\Omega$ .
2. Connect the test leads: Red to +, Black to COM.
3. Turn off power to the circuit being measured.
4. Discharge any capacitors that may influence the reading.
5. Connect the test probes across the resistance.
6. Read the display. If OL appears on the highest range, the resistance is too large to be measured or the circuit is an open circuit.

### Continuity (see Fig. 3)

1. Set the Function Switch to  $\Omega$  and press the SELECT button until  $\text{diode symbol}$  is displayed.
2. Connect the test leads: Red to +, Black to COM.
3. Turn off power to the circuit being measured.
4. Discharge any capacitors that may influence the reading.
5. Connect the test probes across the resistance or the two points of test.
6. Listen for the tone that indicates continuity ( $>10 \Omega$  and  $< 120 \Omega$ ).

### Diodes (see Fig. 3)

1. Set the Function Switch to  $\Omega$  and press the SELECT button until  $\rightarrow$  is displayed.
2. Connect the test leads: Red to +, Black to COM.

3. Turn off power to the circuit being measured.
4. Free at least one end of the diode from the circuit.
5. Connect the test probes across the diode noting polarity.
6. Read the display. A good diode has a forward voltage drop of about 0.6 V. An open or reverse biased diode will read .0L.

#### Capacitance (see Fig. 3)

1. Set the Function Switch to  $\Omega$  and press the SELECT button until  $\text{H}$  is displayed.
2. Connect the test leads: Red to +, Black to COM.
3. Turn off power to the circuit being measured.
4. Discharge the capacitor using a 100 k $\Omega$  resistor.
5. Free at least one end of the capacitor from the circuit.
6. Connect the test probes across the capacitor.
7. Read the display.
8. Relative zero mode can be used to zero out the parasitic capacitance of the leads and the internal protection circuitry of the meter when measuring low capacitance in the order of Pico Farad (pF).

#### MAINTENANCE AND REPAIR

If there appears to be a malfunction during the operation of the meter, the following steps should be performed in order to isolate the cause of the problem:

1. Check the battery.
2. Review the operating instructions for possible mistakes in operating procedure.
3. Inspect and test the test leads for a broken or intermittent connection.

Except for the replacement of the battery or test probes, repair of the multimeter should be performed only by a Factory Authorized Service Center or by other qualified instrument service personnel. The front panel and case can be cleaned with a mild solution of detergent and water. Apply sparingly with a soft cloth and allow to dry completely before using. Do not use aromatic hydrocarbons or chlorinated solvents for cleaning.

#### Battery Replacement (see Fig. 4)

##### Warning

**To prevent electrical shock or meter damage, disconnect the meter's test leads from any circuit and the meter, then turn the meter off before removing the battery cover. Battery replacement should be performed in a clean environment and with appropriate care taken to avoid contaminating the meter's interior components.**

1. Remove the screw and lift the battery cover.
2. Replace the batteries with the same type (1.5V AAA). Note polarity guide below the battery.
3. Replace the battery cover and screw.



## SPECIFICATIONS

### General Specifications

Display:	3-3/4 digits 4000 counts LCD display
Update Rate:	3 per second nominal
Polarity:	Automatic
Power Supply:	standard 1.5V AAA Size (NEDA 24G or IEC R03) battery x
Power Consumption:	typical 11 mA for ACA/DCA and 2.9 mA for other functions
APO Timing:	idle for 30 minutes
APO Consumption:	typical 10 $\mu$ A for ACDC- 100 and 90 $\mu$ A for ACDC- 100 TRMS
Low battery:	below approx. 2.4V
Environment:	Indoor operation, below 2000 m
Temperature / Humidity:	
Operating:	0°C to 40°C (14°F to 122 °F)
Relative humidity :	< 80% RH @ 31°C decreasing linearly to 50% RH at 40°C
Storage:	-20°C to 60°C (-4°F to 122 °F) / < 80% RH
Temperature Coefficient :	0. 5 x (specified accuracy)/ °C @ (0°C to 18°C or 28°C to 40°C)
Sensing :	Average sensing for ACDC- 100; True RMS for ACDC- 100 TRMS
Clamp-on jaw:	DC 1000A or AC 800A rms continuous
+ & COM terminals (all functions) :	600VDC/VAC rms
Jaw opening:	50mm max
Dimension :	227 x 78 x 40mm (8.9 x 3.1 x 1.6 in.)
Weight :	290 gm ( 0.6 lb)
Safety LVD:	Meets EN61011-1:2001; EN61010-2-032(2002), Category III- 600 Volts ac & dc; pollution degree : 2; class 2

**CE** EMC: This product complies with requirements of the following European Community Directives: 89/336/EEC (Electromagnetic Compatibility) and 73/23/EEC (Low Voltage) as amended by 93/68/EEC (CE Marking). However, electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit. Measuring instruments will also respond to unwanted signals that may be present within the measurement circuit. Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electronic interference.

Electrical (23 °C ± 5 °C) < 75% RH

#### DC Voltage

RANGE	Accuracy
400.0 mV	± (0.3% + 3dgts)
4.000V, 40.00V, 400.0V	± (0.5% + 3dgts)
600V	± (1.0% + 4dgts)

Resolution : 0.1 mV on 400 mV range

NMRR : >50dB @ 50/60Hz

CMRR : >20dB @ DC, 50/60Hz, Rs=1kΩ

Input Impedance : 10MΩ, 30pF nominal (1000MΩ for 400.0mV range)

Max input : 600VDC/VAC rms

#### AC Voltage

RANGE	Frequency	Accuracy
400.0mV <sup>1)</sup>	50Hz to 500Hz	± (4.0% + 4dgts)
4.000V, 40.00V, 400.0V	50Hz to 60Hz	± (1.0% + 4dgts)
4.000V, 40.00V, 400.0V	60Hz to 500Hz	± (1.5% + 4dgts)
600V	50Hz to 500Hz	± (2.0% + 4dgts)

Resolution: 0.1 mV on 400 mV range

CMRR : >60db @ DC to 60Hz, Rs= 1kΩ

Input impedance: 10MΩ, 30pf nominal

Crest factor (ACDC-100 TRMS): < 1.6: at full scale; < 3.2: at half scale

Max input: 600VDC/VAC rms

<sup>1)</sup> Selection by Range button manually, and is specified from AC 40mV (AC 60mV for ACDC-100 TRMS) and up

#### Resistance

RANGE	Accuracy
400.0Ω	± (0.8% + 6dgts)
4.000kΩ, 40.00kΩ, 400.0kΩ	± (0.6% + 4dgts)
4.000MΩ	± (1.0% + 4dgts)
40.00MΩ	± (2.0% + 4dgts)

Resolution: 0.1 Ω on 400 Ω range

Open Circuit Voltage : 0.4VDC typical

#### Continuity Tester

Open Circuit Voltage: 0.4Vdc typical

Range: 400.0Ω

Accuracy: ± (1.5% + 6dgts)

Audible threshold: between 10Ω and 120Ω.

#### Diode Tester

Open Circuit Voltage < 1.6 Vdc

Test Current (Typical) 0.4mA

## Capacitance

RANGE <sup>1)</sup>	Accuracy <sup>2) 3)</sup>
500.0 nf, 5.000 µf, 50.00 µf, 500.0 µf, 3000 µf	± (3.5% + 6dgts)

Resolution: 0.1 nf on 500.0 nf range

<sup>1)</sup> Additional 50.00nf range accuracy is not specified

<sup>2)</sup> Accuracies with film capacitor or better

<sup>3)</sup> Specified with battery voltage above 2.8V (approximately half full battery). Accuracy decreases gradually to 12% at low battery warning voltage of approximately 2.4V

## DC Current (Clamp-On)

RANGE	Accuracy <sup>1) 2)</sup>
0.0A to 400.0A	± (1.5% + 4dgts)
400A to 800A	± (1.5% + 4dgts)
800A to 900A	± (2.0% + 4dgts)
900A to 1000A	± (5.0% + 30dgts)

Max current: 1000A continuous

Resolution: 0.1 A on 400 A range

<sup>1)</sup> Induced error from adjacent current-carrying conductor: < 0.01A/A

<sup>2)</sup> Zero mode must be applied to zero the unit before measurement to ensure accuracy.

## ACA Current (Clamp-on)

RANGE	Frequency	Accuracy <sup>1) 2)</sup>
400.0A	5Hz to 40Hz	± (2.0% + 5dgts) <sup>3)</sup>
400.0A	40Hz to 200Hz	± (1.5% + 5dgts)
< 50A <sup>4)</sup>	200Hz to 400Hz	± (1.5% + 5dgts)
< 50A <sup>4)</sup>	400Hz to 1kHz	± (2.0% + 5dgts)
400A to 600A	5Hz to 40Hz	± (2.0% + 5dgts) <sup>3)</sup>
400A to 600A	40Hz to 100Hz	± (1.5% + 4dgts)
600A to 800A	5Hz to 60Hz	± (5.0% + 30dgts)

Max current: 800A rms continuous

Resolution: 0.1 A on 400 A range

<sup>1)</sup> Induced error from adjacent current-carrying conductor: < 0.01A/A

<sup>2)</sup> Crest Factor (ACDC-100 TRMS): < 1.6 : at full scale; < 3.2 : at half scale

<sup>3)</sup> ± (4.0% + 5dgts) for ACDC- 100 TRMS

<sup>4)</sup> Accuracy is specified at <50A in this frequency bandwidth due to limited calibrator output capability for testing

ACDC-100-F02

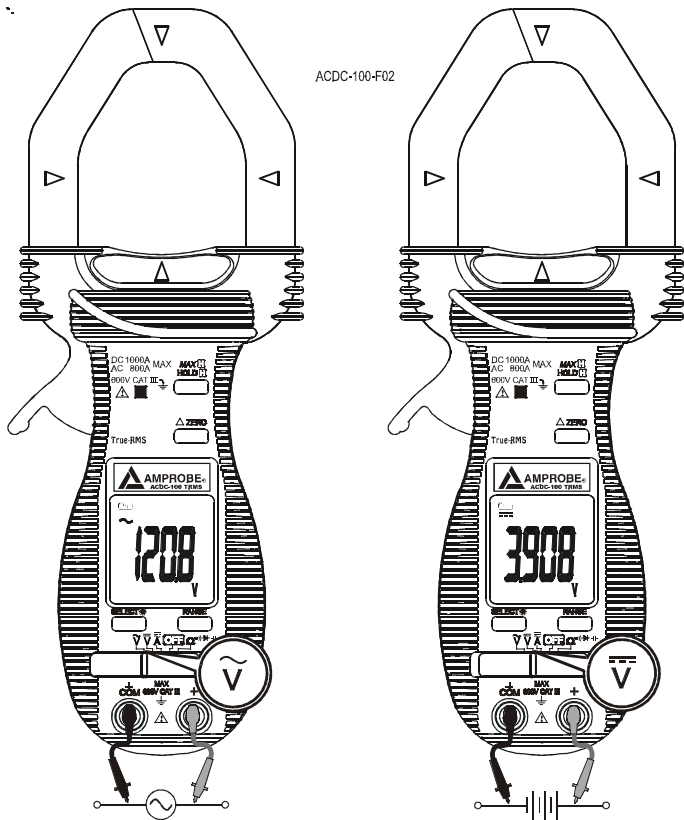


Figure 1. — DC Voltage and AC Voltage functions

ACDC-100-F03

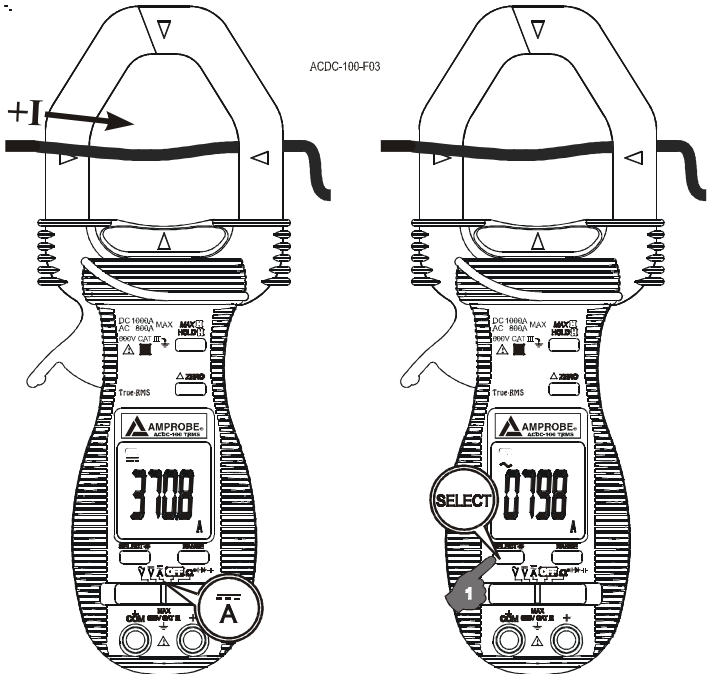


Figure 2. — ACA & DCA Current clamp-on function

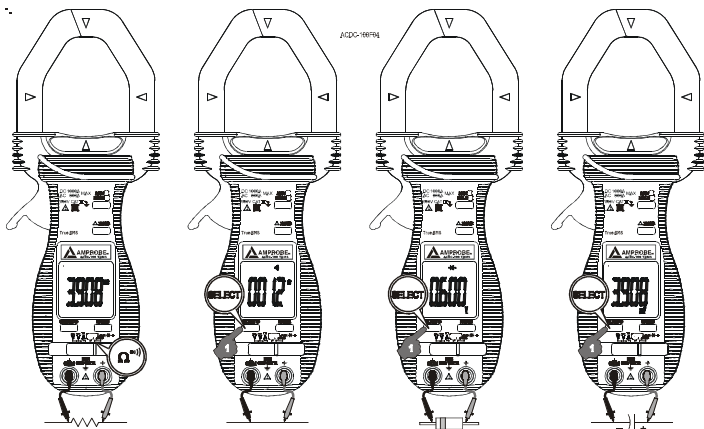


Figure 3. — Resistance, Continuity, Capacitance and Diode functions

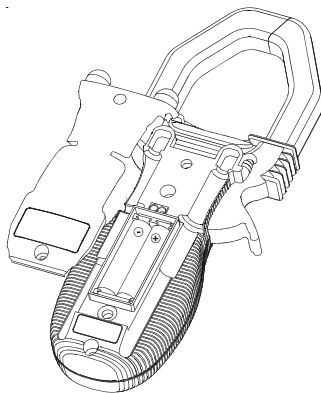


Figure 4. — Battery replacement